The Sleep Duration of Student Athletes

An Honor Thesis (PSYS 499)

by

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Abstract

Division I, student athletes have incredibly busy schedules with practice, school, games, and more. Trying to manage all of these activities can be difficult and can pose a problem for the most important area in an athlete's life: sleep. Sleep is crucial for recovery and functioning. The Reasoned Action Model (RAM) is the most recent technique for predicting behavior. It has been used for predicting intention based on attitude, perceived normative pressure, and perceived behavioral control (PBC). The purpose of this study was to examine sleep behaviors of college athletes and to compare the sleep behaviors with those who are not college athletes using the measures of attitude, perceived normative pressure, PBC, and behavior intention in the RAM. This study compared the results of college student athletes to the traditional college students used in the Tagler, Stanko, and Forbey study (2017). This study surveyed the student athlete population from a university with Division I athletics. The results of this study supported the RAM, as intention was predicted based on variables of attitude, perceived normative pressure, and PBC according to a bivariate correlation. This study also found that, unlike traditional college students, student athletes' PBC was not a significant predictor after accounting for the influence of attitude and perceived normative pressure. Further research is needed to discover why this occurred.

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Lastly, I would like to thank my family and friends for supporting me and encouraging me to be the best person I could be throughout my four years at Ball State.

Process Analysis Statement

In fifth grade, I fell in love with the sport of field hockey. I continued playing the sport throughout high school and was given the opportunity to continue my passion of field hockey in college at the Division I level at Ball State University. Throughout my four years on a Division I sports team, I learned a lot about time management and how to balance academics, athletics, and all other college activities. This skill did not come easy, and there were many nights where I did not get anywhere near eight hours of sleep. Sleep is an essential part of living beings. For athletes, sleep allows the body to recover from the strenuous training being done daily. I knew for my senior thesis that I wanted to incorporate athletics since it was such a big part of my undergraduate experience. After looking at all areas of research on the psychological science department website, I found Dr. Michael Tagler, who has studied attitudes, sleep habits, and the Theory of Planned Behavior. After getting confirmation, Dr. Tagler and I started research for my collegiate athletics and sleep behavior research study. Not much research has been completed over the two topics, so I thought it would an interesting area of study.

I spent a lot of time talking and working with Dr. Tagler to develop a plan and find research about my topic of interest. During winter break, I worked on getting my IRB approval, so I could work with human subjects. Completing the IRB proposal required documenting everything about the research project. I discussed my rationale, hypotheses, plan of action, means of getting participants, and much more. While I was waiting for the IRB's approval, I continued meeting with my advisor to discuss protocols and to go over the Qualtrics survey creation process. I created my Qualtrics survey based on my questionnaire containing measures of attitude, perceived normative pressure, perceived behavioral control, and intention. Once I received approval from the IRB, I emailed a contact in the Ball State Athletic department who

could send out an email to the entire Ball State University student athlete population. I was able to spread my thesis by word of mouth to a majority of the sports teams on campus, as I was trying to get as many participants as possible. Due to the pandemic, I was not able to promote my thesis in person as much as I had hoped, but I persisted and eventually received enough participants to begin my analyses. After running my analyses, I slowly started putting my final paper together.

Throughout the process of my thesis, I learned a lot about conducting experiments and the uncontrollable, unexpected situations that can arise. For this project, I was hoping to do a 7-day sleep study involving wrist actigraphy bands and sleep journaling. Due to the pandemic, I was not able to follow through with this part of the study, as I was not allowed to have contact with people. I decided to add the 7-day study to the future research section of my thesis, as I believe it would be really interesting to look at, and it provide more information and reasoning on why I received the results I did.

The Sleep Duration of College Athletes

Many athletic children aspire to play Division I athletics for the sport they fell in love with. The dream comes true for a select few athletes, whose drive and dedication for the sport exceeds expectations. Being given the opportunity to continue the sport a child falls in love with is an honor that comes with difficulty and dedication. Playing a sport is college is a huge step from high school sports. Most notably, athletics can take up a majority of an athlete's day. Athletes often wake up at 6 a.m. for practice and do not go home until after 5 p.m. Within that timeframe, the student athlete might have practice, strength and conditioning, treatment for injuries, class(es), mandated study tables, tutoring, and much more. During the season, traveling and game scheduling can take up even additional time and adds more variability to daily schedules.

Of course, outstanding athletic performance is not the only outcome for the successful college athlete. Because only a few athletes go on to a professional sports career, a time commitment toward academics is essential for earning a degree in order to prepare for their futures after college athletics. Finding the ability to balance both academics and athletics is challenging for many student athletes. Balancing homework, athletics, academics, and social activities is near impossible without mastering proper time management skills. Without these management skills, getting adequate sleep can pose as a major challenge for many student athletes. Sleep is a very important component of recovery and functioning. Inadequate sleep is a health issue among college students, as 20% of college students report sleep difficulties that impact their academic performance (Branscum et al., 2018). Without proper sleep, student athletes are not able to perform to their best abilities in the classroom and on the field/court/etc, which can have negative impacts on the athletes.

NCAA

The National Collegiate Athletic Association (NCAA) is an organization dedicated to well-being and lifelong success of college athletes ("NCAA Division I", 2015). The NCAA covers three divisions: Division I, Division II, and Division III. Division I covers 350 colleges and universities and contains over 170,000 athletes. Within the 350 colleges and universities, there are more than 6,000 sports teams. The Division II level is composed of 300 colleges and universities and thousands of athletes. Lastly, Division III accounts for over 190,000 athletes at 450 institutions ("NCAA Division I", 2015). The focus of academics is the major difference between the divisions. Division I athletes are at school to excel in both athletics and academics while Division III athletes are mainly at school for an education. The NCAA has been trying to alleviate the stress college athletes experience while in-season and out of season. The NCAA has limited the number of hours student athletes spend on athletic activities, restricted the number of student athletes who live together on campus, and required academic support services for student athletes at Division I institutions (Gayles, 2009). Many institutions mandate study table hours for their athletes in order for the student-athletes to focus solely on academics for a designated period of time. Through study tables, student-athletes learn time management skills that can benefit their academic performance throughout the rest of college. As the NCAA can only do so much for student-athletes, it is up to student-athlete to try to find a healthy balance between athletics and academia.

Sleep

Many student athletes find balancing athletics and academics a struggle. This may cause an athlete to stay up for hours each night in order to complete assignments due the next day. An athlete's sleep is an area of well-being that has received less attention. Sleep is essential for all

humans to survive. Sleep takes up about a third of one's life (Erlacher, 2018). The Centers for Disease Control and Prevention reports that over 35% of U.S. adults sleep less than seven hours in a typical 24-hour period (Centers for Disease Control and Prevention, 2009). Furthermore, about 70% of college students receive less than eight hours of sleep each night (Branscum et al., 2018). Getting less than eight hours of sleep each night is associated with depression, immune system deficits, cognitive impairment, weight gain, diabetes, hypertension, heart disease, and many other health issues.

The role of sleep in an athlete's life goes beyond its normal function; it also contributes to recovery for athletic performance (Litwic-Kaminska, 2017). Coaches try their best to educate their athletes on the importance of sleep, but simply educating the athletes is often not enough. Sometimes the sleep needed for peak performance cannot be achieved due to a disturbance prior to an athletic event (Taheri & Arabameri, 2011). Sufficient sleep is needed for cognitive functions involved in sports performance. Sleep deprivation affects reaction time, cognition, and memory (Taheri & Arabameri, 2011). One study reported that 48-hour periods of sleep deprivation significantly decrease the physical work tasks that require little to no maximum oxygen intake (Rodgers, 1995). Due to its connection with sleep, stress is also a major issue commonly discussed in relation to athletes ((Litwic-Kaminska, 2017). Sleep quality might decrease under different stressful situations involving athletics such as competition, practice, in-season, and out-season (Litwic-Kaminska, 2017). Poor sleep is also connected to depression and anxiety (Tagler et al., 2017).

Reasoned Action Model

A study conducted by Tagler, Stanko, & Forbey (2017) examined if sleep hygiene could be predicted by using the Reasoned Action Model. The Reasoned Action Model (RAM) to

determine the cognitive and social factors that classify whether people do or do not have good sleep hygiene behaviors (Tagler et al., 2017). The RAM is the most recent approach to predicting behavior. It is an update to the Theory of Planned Behavior (TPB; Ajzen, 1985), the Theory of Reasoned Action (Ajzen & Fishbein, 1980), and the Integrative Model (Fishbein, 2008). The reasoned action approach indicates that intentions to perform a behavior is the primary determinant of one's behavior (Branscum et al., 2018). Within each of these theories, there are three predictors of intention to engage in behavior: attitude toward personally engaging in the behavior, perceived normative pressure, and perceived behavioral control (PBC) (Tagler et al., 2017). Attitude is studied in two type: cognitive, or instrumental, and affective, or experimental. Normative pressure depicts one's ways of behavior according to their wants and pressure in ways that are normal to them. Lastly, PBC describes one's capacity and ability to engage in behaviors and autonomy (Branscum et al., 2018). The results from the Tagler, Stanko, and Forbey study support the further use of RAM to predict, understand, and change sleep hygiene behaviors (2017). Additionally, through the studies conducted by the psychologists above, PBC was shown to be a very important factor in predicting sleep duration intention (2017). Researchers have also identified the validity between attitudes, normative pressure, and PBC using the reasoned action approach (Branscum et al., 2018).

Current Research

The purpose of this study was to examine sleep behaviors of college athletes and to compare the sleep behaviors with those who are not college athletes (i.e., general, traditionally aged college students). I compared my results of student athletes with those reported in Tagler, Stanko, and Forbey (2017). Specifically, I administered a survey containing measures of attitude, perceived normative pressure, perceived behavioral control (PBC), and behavioral intention

regarding “allowing time for at least 8+ hours of sleep every night”. The results of the survey were then compared to the results from the comparing study.

The Tagler, Stanko, and Forbey (2017) study was the first to look at and compare specific sleep hygiene behaviors and assess the relative importance of attitude, perceived normative pressure, and PBC for predicting intentions for the different sleep hygiene behaviors. There has not been a lot of previous research looking at collegiate athletics and sleep hygiene behaviors, so in this study, I used some of the methods from the Tagler, Stanko, and Forbey study in order to get a better understanding of how sleep hygiene behaviors are affected by college athletics. I hypothesized that due to the student athlete population’s stressful schedules, student athletes will have poorer sleep quality and sleep for less hours of the night than the non-student athletes used in the Tagler, Stanko, and Forbey study. Similar to the hypotheses posited in the study (2017), I hypothesized that attitude, perceived normative pressure, and PBC will significantly account for the variability in intention to allow for 8 hours of sleep each night.

Method

Participants

Participants in this study were Ball State University student athletes. There were 53 athletes that participated in this study. Of the 53 participants, 4 were males and 43 females. 6 participants did not fill out the sex demographic question. Of the 53 participants, only 44 completed the entire questionnaire, so N=44 (2 males, 42 females). Participants were the typical age for college students (*M= 19.94, SD= 1.32*). Student athletes from almost every sport at Ball State University contributed to the study. Male participants lacked, so consequently the male sport participants were not as represented as the female sports, as seen in Table 1.

Table 1

Sports Team Breakdown

Sport	Participants
Cross Country & Track	4
Field Hockey	8
Football	2
Gymnastics	6
M. Golf	1
M. Volleyball	1
Soccer	4
Softball	3
Tennis	2
W. Basketball	1
W. Golf	2
W. Swimming and Diving	5
W. Volleyball	6

Note. 8 participants left answer blank.

Measures

Attitude. Participants rated "For me, allowing enough time for at least 8 hours of uninterrupted sleep every day is:" on the following 7-point scales: good-bad, positive-negative, valuable-worthless, unpleasant-pleasant, nice-awful, enjoyable-unenjoyable, harmful-beneficial, wonderful-awful, boring-appealing, important-unimportant, necessary-unnecessary, foolish-wise, sick-healthy, and detrimental-constructive (Tagler et al., 2017). The fifteen attitude items on the questionnaire produced a reliable measure (α=.95).

Perceived Normative Pressure. Participants responded to nine items to measure normative pressure on a seven-point scale (Fishbein & Ajzen, 2010). Examples included "Most people who are important to me allow enough time for at least 8 hours of uninterrupted sleep every day" and "I feel social pressure to allow enough time for at least 8 hours of uninterrupted sleep every day". Participants responded to each question on a scale from 1-7 (1 meaning definitely true and 7 meaning definitely false). Meanings of scales vary depending on the

question, and meanings were indicated for each question on the questionnaire. The nine perceived normative pressure items produced a reliable measure (α=.83).

Perceived Behavioral Control (PBC). Participants responded to eight items intended to measure the capacity and components of PBC on 7-point scales (Fishbein & Ajzen, 2010; Yzer, 2012). An example of a PBC question is "How much control do you believe you have over allowing enough time for at least 8 hours of uninterrupted sleep every day?". Participants responded to the prompt on a scale from 1-7 (1 meaning definitely false and 7 meaning definitely true). Meanings of scales vary depending on the question, and meanings were indicated for each question on the questionnaire. The eight items of PBC produced a reliable measure (α=.92).

Behavioral Intention. Participants responded to seven items regarding their intentions to engage in allowing enough time for at least 8 hours of uninterrupted sleep every day. "I am willing to allow enough time for at least 8 hours of uninterrupted sleep every day" is an example of a behavioral intention-based item in the questionnaire. For this specific item, 1 depicted definitely false while 7 represented definitely true. Meanings of scales vary depending on the question, and meanings were indicated for each question on the questionnaire. The seven items of behavioral intention produced a reliable measure (α=.91).

Procedures

Student athletes were asked to participate in a survey containing measures of attitude, perceived normative pressure, perceived behavioral control (PBC), and behavioral intention regarding "allowing enough time to get at least 8 hours of sleep each night for the following week" (Appendix A). All Ball State student athletes were sent a hyperlink by email to voluntarily complete (Appendix B). Prior to the survey, student athletes were prompted to read through an informed consent before they continued on with the questionnaire (Appendix C). Students were

told that if at any point during the survey, they do not feel comfortable answering questions, they were free to stop at any time or simply not answer the question. Participants were told that identifying answers and data would not be used in any publication. Student athletes were also told the purpose, goals, and reasons for the study in the informed consent. Following consent, student athletes were taken to the start of the survey, where they began. Student athletes were thanked for their time at the conclusion of the survey.

Data Coding

There were eight items for the attitude scale, four items for the perceived normative pressure scale, four items for the PBC scale, and four items for the intention scale that were reversed coded. All of the other items for each of the scales were regularly coded using the 7-point Likert scale.

Results

Bivariate Correlations

Bivariate correlations among the attitude, perceived normative pressure, PBC, and intention measures are displayed in Table 2. Consistent with the RAM, intention to allow for at least 8+ hours of sleep each night was significantly and strongly correlated with attitude (*M=6.15, SD=0.80*), perceived normative pressure (*M=4.96, SD=0.95*), and perceived behavioral control (*M=4.27, SD=1.46*).

Table 2

Bivariate Correlations (N=44)

Study (*N=44*)	M	SD	1	2	3	4
1. Attitude	6.15	.80	—			
2. Perceived Normative Pressure	4.96	.95	.65	—		
3. Perceived Behavioral Control	4.27	1.46	.49	.62	—	
4. Intention	5.04	1.37	.76	.71	.53	—

All correlations significant $p < .001$.

Multiple Regressions

A multiple regression was conducted to predict intention regarding "allowing time for at least 8+ hours of sleep every night" based on attitude, perceived normative pressure, and PBC (see Table 3 for full results). The predictors accounted for 66% of the variability in intention to allow time for at least 8+ hours of sleep every night. As hypothesized, attitude, perceived normative pressure, and PBC combined to significantly predict intentions, $F(3, 40) = 26.37$, $p < .001$, and accounted for a large proportion of variability (66%). Whereas both attitude and perceived normative pressure emerged as significant predictors in the regression, PBC did not significantly contribute to the prediction of intention. This PBC result differed from the results of Tagler et al. (2017).

Table 3

Multiple Regression Analyses for "Allowing time for at Least 8+ Hours of Sleep Every Night"

	Study (*N*=44)		
	b	*SE*	β
Attitude	.85	.21	.50*
Perceived Normative Pressure	.50	.20	.35*
Perceived Behavioral Control	.07	.11	.07

Note. Study: F (3,40) = 26.37, $p < .001$, $R^2 = .66$.
b = unstandardized coefficient; *SE* = standard error of the unstandardized coefficient;
β = standardized coefficient; * indicates significant coefficients p<.05.

Discussion

Sleep is essential for all living things. For athletes, the role of sleep goes beyond the normal function, as it contributes to recovery for athletic performance (Litwic-Kaminska, 2017). Many athletes find it hard to balance all of their priorities while still achieving the proper amount of sleep and recovery. Prior research has used the Reasoned Action Model approach to predict behavior, specifically sleep hygiene behaviors. The Tagler, Stanko, and Forbey (2017) study was the first to look at specific sleep hygiene behaviors and assess the relative importance of attitude, perceived normative pressure, and PBC for predicting intentions for the different sleep behaviors. Results from prior studies have supported the continued use of the RAM to predict, understand, and change sleep hygiene behaviors.

The purpose of this current study was to examine sleep behaviors of college athletes and to compare the sleep behaviors with those who are traditional, college students. The design of the study was based off of the 2017 study conducted by Tagler, Stanko, and Forbey. Similar to the Tagler, Stanko, and Forbey study, I hypothesized that attitude, perceived normative pressure, and PBC would significantly account for the variability in intention to allow for 8 hours of sleep each

night. Through the bivariate correlations, I found that attitude, perceived normative pressure, and PBC were predictors of intention when focusing on allowing for at least 8+ hours of sleep each night, which was similar to the findings of the 2017 study. The predictors accounted for 66% of the variability in intention to allow time for at least 8+ hours of sleep every night, which in the Tagler, et. al study accounted for 71%. This hypothesis was supported.

In addition to the prediction of intention based on attitude, perceived normative pressure, and PBC, I hypothesized that student athletes would poorer sleep hygiene behaviors due to their stressful schedules trying to balance academics, sport, and social life. Attitude and perceived normative pressure were significant in predicting intention for both the student athletes in the current study. PBC, however, was not significant in the current study, which contradicted the results of the traditional students used in the Tagler, Stanko, and Forbey study (2017). In the multiple regression, attitude and perceived normative pressure contributed more in student athletes (b = .85, b = .50) than traditional students (b = .36, b = .27). In contrast, perceived behavioral control was much lower in student athletes (b = .07) than in traditional college students (b = .45). PBC did not seem to be an important predictor of intention with the student athletes. This was surprising information found through the current study. There is no definite reason why the student athletes' PBC was much lower than the non-traditional students. As stated previously, perceived behavioral control (PBC) is one's perceived ability to perform a specific behavior, which in this case is allowing for 8+ hours of sleep every night (Ajzen, 2002). One reason the student athletes' PBC was much lower could be because they feel like they do not have control over how much time they sleep for each night or when they are able to go to bed/have to wake up in the morning. This could be due to their busy athletic schedules,

academics, homework, and much more. One cannot be definite on why PBC for student athletes is so low without further testing and research.

Limitations

One limitation of this study was the sample size. There were 53 participants in the current study. Of the 53 participants, only 4 were males. Due to the very small male representation in the current study, it is hard to generalize the results to the Ball State University student athlete population. The University also suspended in-person classes and activities on the campus because of the Coronavirus pandemic. Spreading my thesis by word-of-mouth was very difficult, as it was not possible. A modification to post the study on social media in IRBnet may have been more beneficial to the participation success of the current thesis.

In addition, due to the unforeseen circumstances of school closing, the NCAA suspended all athletic activities for the spring, which affected my entire population for this study (Sallee & Fornelli, 2019). The exact number of hours per day for each of the student athlete's contribution to sport could have been incorrect due to the abrupt change in schedule. Some athletes completed the questionnaire prior to the stipulations placed by the NCAA while others finished the questionnaire afterwards. This confusion may have led to incorrect reports by the athletes.

Future Research

Perceived behavioral control (PBC) did not seem to be as important of a predictor for intention in the student athletes as it did for traditional college students used in the Tagler, Stanko, and Forbey study (2017). With only a questionnaire as a self-report measure in the current study, one cannot be completely certain why this is occurred. The next step for this study would be completing another portion of the study completed with the traditional college students involving wrist actigraphy bands. The purpose of the further study would be to test the degree to

which behavioral intentions predict actual behavior (sleep duration). Student athletes would volunteer to participant in the study where they would complete the questionnaire used in the current study, in addition to a 7-day sleep track using wrist actigraphy bands and sleep journaling. The sleep journal would serve as a self-report method of time to bed and time out of bed while wrist activity will provide an objective, validated method to quantify actual sleep duration.

Another idea for future research would be to further the examination of the current study. One change would be to promote the questionnaire to more college student athletes to try to receive more responses to receive a better representation of the student athlete population. Furthermore, this study could include the entire Mid-American Conference (MAC), not just Ball State University. Ball State University is just one of the many schools in the MAC. Including more than one school could not only allow for a better change of more participants, but it will also enable the researcher to generalize the results better to the student athlete population.

Conclusion

Sleep is an essential part in everyone's lives, but many times, people do not allow themselves to receive at least 8 hours of sleep every night, which can affect their health and wellbeing. For athletes, specifically those in college, receiving at least 8 hours of sleep every night may not be as obtainable due to their busy schedules with academics, athletics, and other events in their lives. The RAM is the most recent approach for predicting behavior. Through this research, I was able to support the RAM and its validity, as intention was predicted by the attitude, perceived normative pressure, and PBC that the student athletes reported through the surveys. Contrary to the research conducted on traditional college students, the information collected on the student athletes reports that PBC was not a significant factor in allowing for at

least 8 hours of sleep every night according to the multiple regression. Future research can be conducted to see why this occurred.

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Appendix A

Please answer the following questions about yourself. Date: _____

1. How old are you? _____ (years)
2. Your biological sex (please circle one): Male Female
3. Your race/ethnicity (please circle the one group with whom you identify the most):

   Black/African American Asian/Pacific Islander Hispanic

   White/Anglo-American Native American Other
4. Relationship Status (please circle one): Single Married Divorced Widowed Separated
5. Your academic class (please circle one): Freshman Sophomore Junior Senior Graduate
6. Your academic major(s) (if undecided leave blank):

   _____
7. Your academic minor(s) (if undecided leave blank):

   _____
8. Number of academic credits enrolled in this semester: _____
9. Your current place of residence is (please check one):

   _____Dormitory with no roommate
   _____Dormitory with one roommate
   _____Dormitory with 2 or more roommates
   _____Fraternity/Sorority House
   _____Off-campus rental apartment
   _____Off-campus rental house
   _____Parents or other Relatives Home
   _____Other (please describe): _____

10. Do you currently work for pay on a full or part-time basis? (please circle) YES NO

    a. If YES for how many hours a week? _____

11. Your sport: _____

12. Your season (please circle one): Fall Winter Spring

13. Your eligibility year: _____

14. Number of hours currently each day spent with sport (please respond to all):

_____Sunday
_____Monday
_____Tuesday
_____Wednesday
_____Thursday
_____Friday
_____Saturday

Please answer each of the following questions by selecting the interval that best describes your opinions toward **allowing enough time for at least 8 hours of uninterrupted sleep every day.**

For me, allowing enough time for at least 8 hours of uninterrupted sleep every day is:

bad	:_____:_____:_____:_____:_____:_____:_____:	good
positive	:_____:_____:_____:_____:_____:_____:_____:	negative
valuable	:_____:_____:_____:_____:_____:_____:_____:	worthless
unpleasant	:_____:_____:_____:_____:_____:_____:_____:	pleasant
nice	:_____:_____:_____:_____:_____:_____:_____:	awful
enjoyable	:_____:_____:_____:_____:_____:_____:_____:	unenjoyable
harmful	:_____:_____:_____:_____:_____:_____:_____:	beneficial
wonderful	:_____:_____:_____:_____:_____:_____:_____:	awful
boring	:_____:_____:_____:_____:_____:_____:_____:	appealing
important	:_____:_____:_____:_____:_____:_____:_____:	unimportant
necessary	:_____:_____:_____:_____:_____:_____:_____:	unnecessary
foolish	:_____:_____:_____:_____:_____:_____:_____:	wise
productive	:_____:_____:_____:_____:_____:_____:_____:	unproductive
sick	:_____:_____:_____:_____:_____:_____:_____:	healthy
detrimental	:_____:_____:_____:_____:_____:_____:_____:	constructive

Please answer each of the following questions by selecting the interval that best describes your opinions toward **allowing enough time for at least 8 hours of uninterrupted sleep every day.**

For me to allow enough time for at least 8 hours of uninterrupted sleep every day would be:
impossible : : : : : : : : possible

I plan to allow enough time for at least 8 hours of uninterrupted sleep every day.
strongly disagree : : : : : : : : strongly agree

Most people who are important to me allow enough time for at least 8 hours of uninterrupted sleep every day.
definitely true : : : : : : : : definitely false

How much control do you believe you have over allowing enough time for at least 8 hours of uninterrupted sleep every day?
no control : : : : : : : : complete control

I will allow enough time for at least 8 hours of uninterrupted sleep every day.
extremely unlikely : : : : : : : : extremely likely

I expect to allow enough time for at least 8 hours of uninterrupted sleep every day.
strongly agree : : : : : : : : strongly disagree

Most people who are important to me think that I should allow enough time for at least 8 hours of uninterrupted sleep every day.
definitely true : : : : : : : : definitely false

It would be
very easy : : : : : : : : very difficult
for me to allow enough time for at least 8 hours of uninterrupted sleep every day.

The people in my life whose opinions I value would
approve : : : : : : : : disapprove
of me allowing enough time for at least 8 hours of uninterrupted sleep every day.

Most people I respect and admire think that I
should not : : : : : : : : should
allow enough time for at least 8 hours of uninterrupted sleep every day.

I feel social pressure to allow enough time for at least 8 hours of uninterrupted sleep every day.
strongly disagree : : : : : : : : strongly agree

I am willing to allow enough time for at least 8 hours of uninterrupted sleep every day.
definitely false : : : : : : : : definitely true

It is mostly up to me whether or not I allow enough time for at least 8 hours of uninterrupted sleep every day.

strongly agree :_____:_____:_____:_____:_____:_____:_____: strongly disagree

I will try to allow enough time for at least 8 hours of uninterrupted sleep every day.

Definitely true :_____:_____:_____:_____:_____:_____:_____: definitely false

Most people I respect and admire allow enough time for at least 8 hours of uninterrupted sleep every day.

unlikely :_____:_____:_____:_____:_____:_____:_____: likely

Most people like me allow enough time for at least 8 hours of uninterrupted sleep every day.

strongly agree :_____:_____:_____:_____:_____:_____:_____: strongly disagree

I intend to allow enough time for at least 8 hours of uninterrupted sleep every day.

definitely true :_____:_____:_____:_____:_____:_____:_____: definitely false

The people in my life whose opinions I value

do :_____:_____:_____:_____:_____:_____:_____: do not

allow enough time for at least 8 hours of uninterrupted sleep every day.

If I wanted to, I could allow enough time for at least 8 hours of uninterrupted sleep every day.

definitely true :_____:_____:_____:_____:_____:_____:_____: definitely false

I am confident that I can allow enough time for at least 8 hours of uninterrupted sleep every day.

definitely false :_____:_____:_____:_____:_____:_____:_____: definitely true

It is expected of me that I allow enough time for at least 8 hours of uninterrupted sleep every day.

definitely false :_____:_____:_____:_____:_____:_____:_____: definitely true

For me to allow enough time for at least 8 hours of uninterrupted sleep every day is

not at all :_____:_____:_____:_____:_____:_____:_____: completely

under my control.

The number of events outside my control which could prevent me from allowing enough time for at least 8 hours of uninterrupted sleep every day are:

very few :_____:_____:_____:_____:_____:_____:_____: numerous

I will make an effort to allow enough time for at least 8 hours of uninterrupted sleep every day.

strongly agree :_____:_____:_____:_____:_____:_____:_____: strongly disagree

Appendix B

Calling all BSU student athletes!

My name is Alison McMullen, and I am a senior on the field hockey team. I am in the honors college working on my thesis focusing on student athletes and sleep and how the sleep quality of student athletes compares to the non-student athlete population. Due to the unforeseen circumstances, I had to reform my thesis over the past few days to an online-only thesis.

I am seeking participants for a sleep study titled: The Sleep Duration of College Athletes (IRB #1533661-1).

To participate, one must be at least 18 years old and a member of a Ball State University, Division I sports team. Participants will complete a survey that will take **no more than 10 minutes** to fill out. If you have a few minutes to take this survey, I would be really appreciative!

https://bsu.qualtrics.com/jfe/form/SV_b2vhN8FgbEfsVhj

Thank you so much for your time,

Alison McMullen
Principle Investigator
Psychological Science
Senior, Field Hockey
akmcmullen@bsu.edu

Michael J. Tagler, Ph.D.
Faculty Advisor
Psychological Science
NQ 110
mjtagler@bsu.edu

Appendix C

Informed Consent
(IRB #1533661-1)

Study Title
The Sleep Duration of College Athletes

Study Purpose and Rationale
The purpose of this study is to examine sleep behaviors of college athletes and to compare the sleep behaviors with those who are traditional, college students. Not very many studies have been completed involving college athletics and sleep, so this study is significant because sleep is a very important area in one's life. Allowing athletes and coaches to better understand the power of getting enough sleep might help improve both academic and athletic performance.

Inclusion/Exclusion Criteria
To be in this study, you must:
- be a college student
- be at least 18 years old
- be a Division I student athlete

To be in this study you cannot:
- be a traditional, college student (no Division I athletics)
- be younger than 18

Participation Procedures and Duration
If you agree to be in this study, you will answer questions about your attitude, perceived normative pressure, perceived behavioral control, and behavioral intention. Responses to all questions will be on a seven-point scale indicated on the survey. Completing this survey will take no more than 10 minutes. Completing this survey can be done on both computers and smart phones. When using a smart phone, turning the phone horizontally allows for the best of the display of the survey.

Data Confidentiality or Anonymity
If you agree to be in this study, your responses will be kept anonymous. There will be no way to connect your responses to you.

Storage of Data and Data Retention Period
Your answers will be saved on a password protected computer indefinitely. This will allow for the future use of your data for other studies.

Risks or Discomforts
There are no risks involved with taking this survey.

Benefits
There are no benefits for being in this study. Your participation will help us better understand how college athletics impacts one's sleep hygiene and behaviors.

Voluntary Participation

Participating in this survey is entirely up to you. You may stop being in the study at any time. Any incomplete information provided will be exempt from the analyses of the project. You do not have to answer any question you do not feel comfortable answering. If you have any questions, please feel free to talk to the principal investigator (akmcmullen@bsu.edu) before or at any point during the study.

Other Questions or Concerns

Please feel free to contact the principal investigator, Alison McMullen, with any questions or concerns. Alison can be contacted at akmcmullen@bsu.edu.

Consent

I agree to participate in this project titled, “The Sleep Duration of College Athletes”. I have read through the information provided above and do not have any further questions pertaining to the study. I give my consent to participate.

Office of Research Integrity
Institutional Review Board (IRB)
2000 University Avenue
Muncie, IN 47306-0155
Phone: 765-285-5052
E-mail: orihelp@bsu.edu

DATE:	February 12, 2020
TO:	Alison McMullen
FROM:	Ball State University IRB
RE:	IRB protocol # 1533661-1
TITLE:	The Sleep Duration of College Athletes
SUBMISSION TYPE:	New Project
BOARD DECISION:	APPROVED
PROJECT STATUS:	ACTIVE
DECISION DATE:	February 12, 2020
REVIEW TYPE:	**Expedited:** This protocol had been determined by the board to meet the definition of minimal risk.

The Institutional Review Board has approved your New Project for the above protocol, effective on February 12, 2020. Your project falls into the Expedited Category indicated below. As such, there will be no further review of your protocol, and you are cleared to proceed with the procedures outlined in your protocol. As an expedited study, there is no requirement for continuing review. Your protocol will remain on file with the IRB as a matter of record. All research under this protocol must be conducted in accordance with the approved submission and in accordance with the principles of the Belmont Report.

Your project falls under the indicated Expedited Categories:

	Category 1: Clinical studies of drugs and medical devices
	Category 2: Collection of blood samples by Finger stick, Heel stick, Ear stick, or Venipuncture
	Category 3: Prospective collection of biological specimens for research purposes by noninvasive means
x	**Category 4:** Collection of data through Non-Invasive Procedures Routinely Employed in Clinical Practice, excluding procedures involving Material (Data, Documents, Records, or Specimens) that have been collected, or will be collected solely for non-research purposes (such as medical treatment or diagnosis)
	Category 5: Research involving materials that have been collected or will be collected solely for non-research purposes.

	Category 6: Collection of Data from Voice, Video, Digital, or Image Recordings Made for Research Purposes
	Category 7: Research on Individual or Group Characteristics or Behavior or Research Employing Survey, Interview Oral History, Focus Group, Program Evaluation, Human Factors, Evaluation, or Quality Assurance Methodologies
	Category 8: Continuing review of research previously approved by the convened IRB
	Category 9: Continuing review of research, not conducted under an investigational new drug application or investigational device exemption where categories 2-8 do not apply but the IRB has determined and documented at a convened meeting that the research involves no greater than minimal risk and not additional risks have been identified.

Categories where the IRB has decided to downgrade protocol to Expedited review:

	Category 1: Continuing review of research previously approved by the convened IRB, where research activities are limited to data analysis only.
	Category 2: Continuing review of research, not conducted under an investigational new drug application or investigational device exemption where categories two (2) through eight (8) research involves no greater than minimal risk and no additional risks have been identified.
	Category 3: Protocol modifications have resulted in the protocol becoming minimal risk and qualifying for Expedited review.

Editorial Notes:

1. Approved

While your project does not require continuing review, it is the responsibility of the P.I. (and, if applicable, faculty supervisor) to inform the IRB if the procedures presented in this protocol are to be modified or if problems related to human research participants arise in connection with this project. Any of these notifications must be addressed in writing and submitted electronically to IRBNet (www.irbnet.org). Please reference your IRB protocol number 1533661-1 in any communication to the IRB regarding this project. Be sure to allow sufficient time for review and approval of requests for modification or continuation. If you have questions, please contact Sena Lim at (765)285-5034 or slim2@bsu.edu.

In the case of an adverse event and/or unanticipated problem, you will need to submit written documentation of the event to IRBNet under this protocol number and you will need to directly notify the Office of Research Integrity (http://www.bsu.edu/irb) **within 5 business days**. If you have questions, please contact Sena Lim at (765)285-5034 or slim2@bsu.edu.

Please note that all research records must be retained for a minimum of three years after the completion of the project or as required under Federal and/or State regulations (ex. HIPAA, FERPA, etc.). Additional requirements may apply.